

THE REFUGE FIRE REHABILITATION PLAN
LOWER KLAMATH NWR
AUGUST 4, 1998

I. BACKGROUND

Location & Size

The Refuge Wildfire was reported at 1330 on August 4, 1998. The fire originated within the Lower Klamath Wildlife refuge, northeast of Laird's Landing near the Dorris Brownell Road. It was started by a tractor mowing an access road within the refuge in unit 13. The fire was located approximately fifteen miles southwest of Tulelake, California in Township 47 north, Range 2 east, in the northwest corner of section 25.

After ignition the fire began spreading to the south and southeast due to the winds from the southwest, estimated on site at 11 mph. High live fuel moisture in the herbaceous fuels to the north prevented any significant spread in that direction. The fuels at the location of the ignition were mainly grasses (fuel model 1 and 3) with some shrubs (fuel model 5).

The fire account number on this incident is still open due to the fire burning in organic soils (peat). The major suppression efforts ended in late September, but we continued to find smoldering spots into January. Some of the spots were over three feet deep and difficult to find as they were spreading under the surface. We do not want to call this fire out until the fall burning season is over, although we are almost certain that the very wet spring has suppressed the fire. Even though the fire account is still open and the fire has not officially been declared out we would like to submit this rehabilitation plan to get some of the projects started.

Soils

The soils of Lower Klamath NWR developed under the former Lower Klamath Lake and are a result of lacustrine deposits and volcanic ash. A distinguishing feature of the soils is the high amount of diatomaceous material present. Soils of the Straits Unit have been classified by the U.S. Soil Conservation Service as Algoma silt loam, Tulana silt loam, and sandy substratum.

Topography

The area in which the fire originated on Lower Klamath NWR is upland associated with the old lake shore. The areas to the north and east are several large seasonal marshes over 1,000 acres in size. The area to the south is a gradual slope up to a plateau that has little access and several small drainages. Most of the land is owned by US Forest Service with Bureau of Land Management and private land mixed in.

Climate

The refuge has a semi-arid climate with dry, hot summers and cold winters. Summer temperatures can occasionally reach 100 F, but generally cool rapidly during the evening and night time hours. Nighttime temperatures can, and often do, dip below 32 F during the summer months. January is the coldest month of the year, with temperatures occasionally dropping below -30 F. Daytime temperatures during January often exceed 40 F.

Precipitation generally occurs during the winter and spring months, with the refuge receiving approximately 7-11 inches of rainfall annually. The surrounding higher elevations receive more precipitation and this finds its way into the basin through a series of rivers and creeks.

Vegetation

Vegetation on Lower Klamath ranges from submergent plants such as Sago pondweed (*Potamogeton pectinatus*) which dominates open water areas to upland areas dominated by perennial bunch grasses and other upland species. Within permanently flooded wetlands, the greatest factor influencing vegetative communities is water depth. Deeper water areas are dominated by Sago pondweed while shallow water areas support emergent plants such as hardstem bulrush (*Scripus acutus*) and cattail (*Typha* spp.).

In seasonal wetlands, timing of drawdowns and soil type has the greatest influence on plant communities. Early drawdowns (February-April) result in plants such as foxtail barley (*Hordeum jubatum*) and various species of aster. Later drawdowns encourage hardstem bulrush, alkali bulrush (*S. martinus*), red goosefoot (*Chenopodium botryodes*), and smartweed (*Polygonum* spp.) Seasonally flooded wetlands contain the greatest plant diversity, especially those marshes having diverse topography.

Uplands contain a variety of annual and perennial grasses, many of which are non-native (ie. tall wheat grass (*Agropyron* spp.), and cheat grass (*Bromus tectorum*).

Fire intensity

A strong high pressure system had been in place for the week prior to August 4th. The weather recorded at the Lower Klamath FTS weather station at the time the fire started was: 97 degrees, relative humidity 11 percent with a northwest wind at 3 miles per hour.

Fire in the grassy fuels averaged flame lengths of 3 to 4 feet. The rate of spread through this fuel type was 40 to 60 chains per hour. The fire in the brush/shrubs had flame lengths of 25 feet. The rate of spread was estimated at 40 to 60 chains per hour. Spotting was observed to be 50 to 75 feet ahead of the fire

Hydrology

Water levels in surrounding seasonal and permanent marshes were normal or above due to a wetter than average spring.

Land Ownership

The Refuge Fire burned a total of nine thousand seven hundred acres. Consisting of 5,600 acres of Modoc National Forest land, 800 acres of State, 700 acres of private, 1,200 acres of Bureau of Land Management and 1,400 acres of Fish and Wildlife land.

B.

Resource uses

Lower Klamath NWR is the most productive refuge in the Klamath Basin NWR complex and contains the majority of the 411 species of wildlife occurring on the complex. Most species occurring on the refuge are dependent on wetlands, with waterfowl being the most conspicuous. During fall and spring migration, up to 1 million waterfowl rest and feed on Lower Klamath NWR.

In addition to waterfowl, the refuge is important to a variety of vertebrate species that are of federal and state concern. Bald eagles that originate in the Pacific Northwest and Western Canada are the most numerous of the threatened and endangered species on the refuge. Populations have been steadily increasing to the peak of over 1,100 eagles during the winter of 1991-92. Bald eagles are attracted to Lower Klamath refuge by large populations of waterfowl and microtine rodents. Rodents are heavily utilized by eagles when refuge farm units are pre-irrigated during the fall and winter. Peregrine falcons are also present on the refuge and prey on waterfowl and shorebirds.

Lower Klamath NWR is an important area to neotropical migratory birds, especially those that are dependent on wetland habitats.

II EVALUATION & ANALYSIS

A. Physical factors

The fire improved wildlife habitat by removing older and decadent sage brush, crested wheat grass, meadow sedges, hardstem bullrush, and alkali bullrush. This restored the vigor and stimulated native plant species and maintained various stages of succession in plant communities. The fire also provided new succulent growth for migrating waterfowl in the spring and promoted open acres for nesting and loafing opportunities.

The fire suppression efforts caused impacts to two known archaeological sites, CA-SIS-223 and CA-SIS-234. It is unknown at this time if the fire or fire suppression efforts caused damage to eleven other recorded sites in the area.

Inspection of the fire by Anan Raymond and Alex Bourdeau of the Region 1 Cultural Resources Team determined that CA-SIS-223 had been damaged during suppression efforts by the excavation of a fire line through a portion of the site and by foot and vehicle traffic. Soils in the

area are very loose and friable, vehicles transecting the site during the suppression efforts displaced artifacts and human remains. This problem was exacerbated by the presence of recently dug potholes. Fire suppression personnel walking through the site collapsed the walls of some of the potholes, disturbing additional materials. Removal of vegetation by the fire has exposed a large number of artifacts, making the site easily recognized. This may result in additional vandalism.

It is estimated that five cubic yards of cultural soils were disturbed during the fire suppression activities. The presence of human remains at this site makes immediate rehabilitation a high priority.

Site CA-SIS-234 was seriously damaged by the use of high pressure hoses in an attempt to extinguish burning sub-surface peat. Water from the hoses scoured channels up to two feet deep into artifact-bearing soils. Flakes and tools from these scoured channels were scattered over a wide area. It is estimated that 15 cubic yards of cultural soils were disturbed during fire suppression activities.

Eleven additional archaeological sites were within the boundaries of the August 4th fire on Lower Klamath NWR. It is unknown if fire suppression activities impacted these sites. As many of them were recorded between 1940 and 1970, site records are sketchy and locational information problematic. It is necessary to make a good faith effort to relocate these sites and determine if they were impacted. As eight of these sites are located on or immediately adjacent to the access road (Dorris -Brownell road) on the southeast side of Lower Klamath Lake, it is likely that vehicles involved in the suppression activities impacted them.

B. Physical facilities

The Refuge fire destroyed approximately 1/2 mile of 4 strand barb wire fence, 26 railroad tie posts and 6 cross brace posts. This is a broken down estimate for the damage in different locations. The total amount for fencing lost was \$ 4,610.

0.5 mile of fence completely destroyed

160 steel t posts x \$3 = \$ 480

8 rolls barb wire x \$ 35 = \$ 280

8 railroad tie posts x \$ 12 = \$ 96

Fence construction Contract = \$ 2,000

15 damaged wooden fence corners

20 railroad tie posts = \$ 240

6 cross brace posts = \$ 48

Contract repair cost = \$ 750

Poverty flats fence southeast corner

18 railroad tie posts x \$ 12 = \$ 216

Contract repair cost = \$ 500

C. Off-site factors

Off-site detrimental effects from the fire, such as run-off, could expose some culture resources, but effects should be minimal.

D. Effects on wildlife

Unit 13 is treated as a permanent marsh and on a prescribed fire cycle. This unit is burned to enhance wildlife diversity by creating mosaics, stimulating native plant species, and maintaining various successional stages of plant communities. Goose habitat should improve due to the removal of dense vegetation on the marsh and nesting habitat will improve after grasses become established. The wildfire should have these same results.

REHABILITATION NEEDS & OBJECTIVES

A. Rehabilitation alternatives

1. Replace lost facilities -The replacement of the Y2 mile of fence and-f1x.ingaU damaged comers is essential to exclude cattle grazing on the Lower Klamath Refuge.
2. Alternative site development -no comparable alternative site exists
3. No action -Without rehabilitating the boundary fence the resulting cattle grazing in the sensitive riparian areas would have a detrimental effect on the habitat. Effects would include accelerated erosion, introduction of non-native plants and water fowl and upland bird nesting disturbed.

B. Recommendations

Cultural Resources

At site CA-SIS-223, it is necessary to return the site to a natural appearance as quickly as possible. Prior to the fire, the site had been damaged by illegal excavation,- including the displacement and possible removal of human remains. The August 4th fire and suppression activities have increased the site's visibility by disturbing additional cultural materials and through removal of grass and brush. It is likely this increased visibility will make finding the site easier for vandals. In addition, the lack of vegetation on the site is increasing the rate of erosion. Surface runoff is cutting channels across the site, displacing additional cultural materials. The potholes on the site are contributing to damage from this process as surface runoff erodes the side walls of the illegal excavations.

If no action is taken, there is increased risk of additional vandalism and erosion by surface runoff.

At site CA-SIS-234, the use of high pressure hoses disturbed large numbers of artifacts, destroying their locational integrity. In archaeological sites, the spatial relationship between artifacts is critical in analyzing the activities which occurred at the site. The displacement of these

materials by suppression activities has adversely affected the data potential of CA-SIS-234. The National Historic Preservation Act (NHP A) requires Federal agencies to mitigate the adverse effects of their actions on sites eligible to the National Register of Historic Places (NRHP). Although CA-SIS-234 has not been formally evaluated for inclusion in the National Register, the quantities of artifacts noted during our inspection of the site indicates it contains significant data about the prehistoric occupation of Lower Klamath Lake, and would be eligible to the National Register. As a result, it is our opinion the fire suppression activities constitute an adverse effect. No action at this site would constitute a violation of NHP A.

It has been noted by refuge personnel that fire and suppression disturbance has accelerated the rate of wind erosion at this site. It is likely that this erosion is displacing additional cultural materials. The lack of vegetation and the surface scatter of artifacts left by suppression activities increases the likelihood the site will be discovered by vandals.

Mitigation alternatives at CA-SIS-234 include excavation to recover data from the remaining undisturbed portions of the site in order to ascertain what prehistoric activities occurred here. This research would include test excavations to recover data on artifact types, arrangement, site age, stratification and site use. It is also important this site be returned to its pre-fire natural appearance as quickly as possible to reduce erosion and the potential for vandalism which has not been noted at this site in the past.

IV ENVIRONMENTAL CONSIDERATIONS

A. Rehabilitation plan impacts

Cultural resources -The regional archeologist will follow up on this subject

B. Rehabilitation plan compliance to fire management plan

The prescribed bum portion of the fire management plan states that fences which are destroyed will be replaced or repaired if they are needed to meet land management objectives,

V RESOURCE NEEDS & COST SUMMARY

A. Description of units. All units are on Lower Klamath Lake NWR.

-Site CA-SIS-223: A prehistoric site containing evidence of hwnan occupation and burials. The site covers approximately 5000 sq. meters (100m x 50m). Approximately 5 cubic meters of material was disturbed during fire suppression and increased erosion is occurring over the entire site.

-Site CA-SIS-234: A prehistoric site containing large numbers of artifacts and features. The site covers at least 1000 sq. meters (35m x 30m). Approximately 15 cubic meters of material was disturbed during suppression activities and increased erosion is occurring over the entire site.

-Sites CA-SIS-224~ 225, 226, 227,228,229,230,235,240,241 and 248. Located within burned area. Effects from suppression efforts are unknown.

B. Cost per unit.

-CA-SIS-223: Inventory surface archaeological materials. \$3,000

Prepare NRHP evaluation. 2,000

Line looter's holes and fireline with geo-textile and backfill. 1,000

-CA-SIS-234: Conduct remote sensing to delineate site boundaries. 10,000

Subsurface testing to determine nature of data lost during fire suppression. 12,000

Prepare NRHP evaluation. 3,000

-CA-SIS-224, 225, 226, 227, 228, 229, 230, 235, 240, 241 and 248:

Relocate sites and determine impacts, if any, from suppression activities. 7,000

(If impacts from suppression activities are noted during this investigation, additional rehabilitation funds may be necessary to mitigate impacts.)

TOTAL Cultural Resource Rehabilitation Costs. ..\$38,000

This work will be conducted through contract with qualified cultural resource consulting firms.

VI GRAPHIC/PICTORIAL PRESENTATION MAP EXHIBIT

Graphics and photograph stored in project file.